



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,208	08/08/2003	Ben Banney	MAX-0010	4077
23377	7590	10/13/2004	EXAMINER	
WOODCOCK WASHBURN LLP ONE LIBERTY PLACE, 46TH FLOOR 1650 MARKET STREET PHILADELPHIA, PA 19103			DOERRLER, WILLIAM CHARLES	
			ART UNIT	PAPER NUMBER
			3744	

DATE MAILED: 10/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/637,208	Applicant(s) BANNEY ET AL.	
	Examiner William C Doerrler	Art Unit 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9-2-03</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-9 give no units for the variable W. Claims 10-18 are confusing because it is unclear what the relationship between variables is. For example, in claim 10 is any W between 0.05 and 1.0 and any N between 25 and 310 acceptable, or does each W need to be matched with a corresponding N. It also confusing in claims 10-18 to have ranges of N and T, since N and T are defined as minimums. Claims 1,4,7,10,13 and 16 require periods.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Wright et al.

Wright et al disclose a heat exchanger for passing a liquid in thermal contact with a thermoelectric device having 16 fins/inch (column 3 line 43) with the fins having a

Art Unit: 3744

thickness of .008 inch (column 3 line 38). These numbers convert to a thickness of .2 mm and 630 fins/meter. Since there will be 16 fins/inch and the fins are .008inch thick, there will be .128 inch of fin per inch. Dividing the remaining .872 " by 16 leaves each passage with a width of .055", or 1.4mm. Plugging 1.4 as W into the equation of claim 1 yields a minimum N of 426. Thus Wright et al's 630 fins/meter meets the limitation of 426 fins/meter derived from the equation of claim 1.

Claims 1-18 are rejected under 35 U.S.C. 102(b) as being anticipated by the article by Jiang et al.

Jiang et al on page 1044 describe a heat exchanger having channels .2mm wide with walls .2mm thick. Using .2 as W, the equation of claim 1 gives a minimum number of channels/meter as 49.8. If one channel and one wall are combined for .4mm, there will be 2500 channels in a meter of the described heat exchanger. Thus the equation of claim 1 is met. Using .2 as W in the thickness equation of claim 4, gives a minimum thickness of .108 mm. Thus the thickness disclosed (.2mm) meets the minimum claimed in claim 4. The height of the channel is given as .6mm, well below the claimed limit of 10mm. The thermal conductivity of the walls given in page 1044 (398.1) will, if multiplied the given distance and inverted give a thermal resistance of .06K/W, which satisfies the claimed limit. The determined minimum thickness and number of channels using the dimensions above also meet the claimed ranges of claims 10-18. The claims are rejected under 120(b) since the subject matter claimed (the relationship between the channel width, the number of channels and the wall thickness) was not disclosed in the parent application.


Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kendrick shows a heat exchanger for a thermoelectric element. The top of column 10 of Bell teaches a heat exchanger with very small flow channels for use with thermoelectric devices. Cesaroni, Ognibene et al and Vafai et al show microchannel heat exchangers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C Doerrler whose telephone number is (703) 308-0696. The examiner can normally be reached on Monday-Friday 6:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Esquivel can be reached on (703) 308-2597. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


William C Doerrler
Primary Examiner
Art Unit 3744

WCD